

A “Strong Wind Experiment” In Support Of The Cblast “Hurricane Study”

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LONG-TERM GOALS

The long-term goals are to study the changes of momentum and thermal energy content of the upper ocean during strong storms and hurricanes in order to improve modeling of air-sea interaction under strong ocean forcing.

OBJECTIVES

Task(1) Evaluate the hurricane fluxes of heat and momentum to the ocean by observing the changes of momentum and heat content in the upper layers.

Task(2) Assess the survival time and quality of wind data from operational wind sensing drifters relative to NASA/QuikSCAT winds

Task(3) Add directional wave sensing capability to next generation Digital Minimet drifters.

APPROACH

Task(1) During the 2004 Hurricane season an 100km-200km mesoscale array of 38 drifters will be deployed from a C-130 in the path of an Atlantic hurricane. The array will consist of eight ADOS drifters that sense winds, Pa, SST, “ocean color”, and temperature and Pa from 100m long thermistor chains and 37 SVP drifters that sense SST and 15m and 100m velocity.

Task(2) Co-located research quality winds from NASA/QuikSCAT will be used to evaluate the quality of wind sensing drifters. Drifter survival rates will be evaluated relative to initial expectations and historical data.

Task(3) A current sensing device and low cost accelerometer will be integrated into the surface float of a Digital Minimet drifter. Theoretical methods will be used to convert the gravity wave induced velocity spectrum to directional wave height spectrum.

WORK COMPLETED

Task(1) Design of air deployment rigging and packaging for both SVP and ADOS drifters has been completed. Preliminary air deployment tests were successfully completed and the results were reported to all agencies involved (ONR, USAF/AMC, NOAA; Figure 1). Proposed Test Plan for

second stage of air deployment tests and operational certification has been approved by USAF/AMC. Testing by USAF/AMC is in progress.

Task(2) Historical data from 87 drifters has been acquired from MEDS Canada (GTS system/DBCP) and the Global Drifter Center (System Argos). Time series have been evaluated for data quality and plotted. Entire data set is under analysis and we are in the process of interpolating collocated QuikSCAT data for the period Jul 1999 – Jul 2002.

Task(3) Development of single wire communications is in progress. Acquisition of key subsystems including Nortek current meters is completed. Construction of the two test drifters has commenced.

RESULTS

Title: Rigged air deployment box



Figure 1: Air deployment package containing two SVP drifters rigged with parachute.

IMPACT/APPLICATIONS

None

TRANSITIONS

New instrument developments that will be candidates for transition to operational use by Navy and others include: wave-sensor addition to Digital Minimet; ADOS air-deployment certification and

transition to Navy operational observing systems; array design verification for hurricane monitoring and modeling.

RELATED PROJECTS

None

PUBLICATIONS

None

PATENTS

None